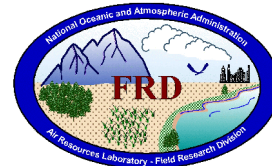


## FRD Activities Report November 2002



### Research Programs

#### *URBAN-2000*

The URBAN-2000 study, conducted during October 2000 in Salt Lake City UT, required that part of the integrated bag samplers have adsorbent CATS tubes attached to the inlets. The CATS tubes are used to collect perfluorocarbon tracer samples. The intent of attaching these to the inlet of the SF<sub>6</sub> samplers was to sample simultaneously for both types of tracers. Experts in perfluorocarbon tracers assured the experiment participants that SF<sub>6</sub> would not be adsorbed on the adsorbent in the CATS tubes. However, this past spring, it was discovered that the CATS tubes had indeed adsorbed part of the SF<sub>6</sub> during the field experiment. By comparing SF<sub>6</sub> concentrations measured from collocated samplers where one sampler was equipped with CATS tubes and one was not, we were able to calculate an approximate correction factor. We have used this correction factor to correct all of the bag sampler SF<sub>6</sub> concentration data and submitted the corrected data to the data archive. Work also continues on a final report for the experiment. (Roger.Carter@noaa.gov, Debbie Lacroix, Kirk Clawson)

#### *IMS Development Project*

Development of an Ion Mobility Spectrometer to measure SF<sub>6</sub> is continuing at a low priority. We are currently testing the prototype with samples of air pumped from outside the laboratory. Unfortunately, the air seems to carry with it contaminants which hide any signal from oxygen or SF<sub>6</sub>. We must solve this problem before we can make a practical field instrument. (Roger.Carter@noaa.gov, Debbie Lacroix, Shane Beard)

#### *ET Probe*

Work on the Extreme Turbulence Probe continued at a reduced pace during November. Calibration of the pressure and temperatures sensors for future field deployment was begun. (Richard.Eckman@noaa.gov, and Tom Strong)

#### *Refractive Turbulence Study (RTS)*

Work continues on data processing/analysis from data that was collected during this summer/fall 2002 campaign in Australia. (Jeff.French@noaa.gov)

## ***Rain In Cumulus over the Ocean (RICO)***

The second draft of the Scientific Overview Document (SOD) was made available to prospective participants of RICO. The document outlines the main objectives of RICO and suggests aiming for fall/winter 2004 for an eight week intensive field study off the northeast coast of Puerto Rico. RICO will focus not only on the development of rain in shallow trade wind cumuli, but will also attempt to gain a better understanding of the organization, formation, and dynamics associated with these clouds. To this degree, it is important to obtain not only in-cloud measurements, but also boundary layer measurements of energy fluxes. Researchers from FRD and the Department of Atmospheric Science from the University of Wyoming will participate in preparing a joint proposal to investigate the dynamics and formation of the clouds in RICO. (Jeff.French@noaa.gov)

## **Cooperative Research with INEEL**

### ***Emergency Operations Center (EOC)***

Roger Carter and Neil Hukari participated in the annual DOE Emergency Operations Center (EOC) requalification training on November 18, 2002. (Neil.Hukari@noaa.gov and Roger Carter)

### ***INEEL Support***

In November a revised list of recommended upgrades to the INEEL dispersion modeling was presented to DOE management. The 12 recommendations were placed into three tiers, with Tier I being the highest priority upgrades, Tier II being important items that should be implemented but could be postponed, and Tier III being upgrades that are desirable but not critical. An upgrade budget was also presented. The DOE management was receptive to the recommendations, but there is some question as to where the funding for such an upgrade will come from. (Richard.Eckman@noaa.gov)

The three computers used to collect and distribute data from the INEEL Mesoscale Meteorological Network (Mesonet) are showing signs of age. The floppy disk drives in all three computers had failed and were replaced this month. (Roger.Carter@noaa.gov)

Additional modifications were made to INEELVIZ adding to the changes from last month. Additional limiting contours were included for the TRA releases, increasing the number of contours from 3 to 5 for the default RSAC scenarios. The output was changed to display the 5 and 10 rem limiting Thyroid dose isopleths. Limiting release scenarios were also added for the INTEC site. A new web server was brought online and the FRD and the ARL Aircraft (<http://ArlAircraft.noaa.inel.gov>) Web sites were moved to the new server. A new web-based INEELVIZ display is now available on the new server. (brad@noaa.inel.gov)

The semi-annual maintenance and calibration of all sensors in the INEEL Mesonet was completed in November. (Tom Strong, [strong@noaa.inel.gov](mailto:strong@noaa.inel.gov))

## ***INEEL Mesoscale Modeling***

The National Centers for Environmental Prediction (NCEP) have recently started to post 12-km Eta model gridded output on their ftp server. These data are broken up into a series of tiles, so that the full 3D model output can be downloaded for a limited region. This provides some new opportunities for the high-resolution MM5 modeling at FRD. Currently, FRD is using coarser resolution Eta model output to drive 3 MM5 grids at 27, 9, and 3 km horizontal grid spacing. With the new tiled NCEP output, it should be possible to drop the coarsest grid and focus on the smaller scales. This was tested on the new dual-processor Intel Xeon computer at FRD by constructing a 2-grid MM5 configuration using 12 and 4 km grids; the coarsest grid was chosen to be 12 km rather than 9 km to match the NCEP output. MM5 was able to run an hour of simulated time in about 2 minutes with this configuration, compared to about 5 minutes with the current 3-grid configuration. The new configuration appears to do a better job of forecasting the temperatures in the Snake River Plain, primarily due to the better initialization. The improvements in the MM5 initialization with the 12 km Eta output appear to more than offset the reduction in resolution (4 km vs. 3 km grids). One test run was performed with a third 1.33 km grid placed right over INEEL. However, this increased the time required to complete an hour of simulated time to about 9 minutes. Although this fine-scale grid resolves some local terrain features at INEEL, it is not clear whether its high computational costs are justified by any forecast improvements. (Richard.Eckman@noaa.gov)

## **Other Activities**

### ***ARL Aircraft***

Representatives from FRD, ATDD and NOAA/AOC visited the Velocity factory in Sebastian, Florida. Discussions were held with company president Duane Swing and vice-president Scott Baker regarding the possibility of acquiring a modified Velocity XL for use as a NOAA aircraft to replace the LongEZ. During the discussions, emphasis was placed on the modifications required to make the velocity a suitable research platform. Other items for discussion included safety, maintenance, and certification. In general, it was decided that the Velocity would best suit ARL's needs for a small, environmental research aircraft (SERA). A list of necessary modifications was given to Velocity, including general requirements for engineering. Velocity is expected to respond with an estimate/bid in early December. (Jeff.French@noaa.gov, Ed Dumas)

### ***Proposals***

A preproposal entitled "A Combined Observational and Modeling Study of Vertical Transport and Diffusion in the Complex Terrain of Southeast Idaho" was sent to the DOE in response to a new program announcement for the Vertical Transport and Mixing (VTMX) program. The major focus of VTMX is to support a second Salt Lake City experiment in 2004. However, FRD decided that the anticipated annual funding for this program is too small to warrant a major deployment of FRD resources to Salt Lake City. Instead, we are proposing to conduct a secondary VTMX study centered around the INEEL Mesonet. Based on the VTMX objectives at

[http://www.sc.doe.gov/production/grants/LAB03\\_09.html](http://www.sc.doe.gov/production/grants/LAB03_09.html), the Snake River Plain near INEEL is an ideal location to conduct VTMX studies. The region experiences many of the stable-flow phenomena, including cold-air pools and complex layering, that are of interest to the program. Moreover, a large network of 34 towers is already in place, and FRD is already conducting routine high-resolution mesoscale modeling of the region. A VTMX study in the Snake River Plain could be done at far less cost than in Salt Lake City, and a much larger portion of the annual budget could be allocated to data analysis rather than instrument deployment and travel expenses. The proposed study is not intended to replace the SLC study, but rather to support it by testing whether the knowledge gained in the SLC studies is transferable to other areas. (Richard.Eckman@noaa.gov and Jerry Crescenti)

A preproposal involving SF<sub>6</sub> atmospheric tracers was also submitted to the DOE in response to the VTMX new program announcement. This preproposal, entitled “Using SF<sub>6</sub> Tracer to Quantify Vertical Mixing within the Stable Boundary Layer” will be a collaboration of scientists from FRD, DOE’s Pacific Northwest National Laboratory and Washington State University. (Kirk.Clawson@noaa.gov)

Another preproposal was submitted in collaboration with Idaho State University and the University of Colorado to extend the current INEEL/FRD Mesonet into the region around Yellowstone National Park. This area is poorly covered by meteorological observations, and there appears to be support from local NWS field offices, the National Park Service, and the university research community to improve the coverage. The most northerly Mesonet towers are already not that far from the Yellowstone Ecosystem, so FRD’s expertise in managing and maintaining a network is a natural fit to the effort. The preproposal passed through an initial level of review, so the next step will be to develop a full proposal for NSF funding. (Richard.Eckman@noaa.gov; David L. McGinnis and Matt Germino, Idaho State University; Mark Williams, University of Colorado)

## ***Outreach***

As a followup to the presentation given to the Temple View Elementary School Fifth Grade in October, the class toured the Field Research Division laboratory on November 1, 2002. They visited with Brad Reese who demonstrated the FRD web page meteorology features. Then they toured the gas analysis laboratory and saw a gas chromatograph and continuous flow analyzer while Shane Beard explained their purpose and how they were used. They also got to see an inflated “smart balloon” of the type recently used in collecting data from Hurricane Kenna, and were shown a demonstration of



**Figure 1.** Shane Beard demonstrates wind measuring instrumentation to a fifth grade class.

how it works and the instruments it carries. Jerry Crescenti gave the children handouts explaining NOAA and the Air Resources Laboratory's research activities. The tour was interesting and informative, and school officials requested that Shane Beard and FRD be a resource in the future. (Shane Beard, Beard@noaa.inel.gov)

On November 29, 2002, Shane Beard gave a tour of the FRD facility to a Boy Scout who was working on his Computer Merit Badge. Along with the tour, Shane demonstrated how computers were used for research and weather support conducted at FRD. The information will be used to complete one of the requirements for the merit badge. (Shane Beard, Beard@noaa.inel.gov)

### ***Science, Technology, and Energy Committee***

Jerry Crescenti and Debbie Lacroix attended the Science, Technology, and Energy Committee Meeting sponsored by the Idaho Falls Chamber of Commerce. This group had its inaugural meeting on November 15, 2002. The group is comprised of individuals from various backgrounds (city, state and federal governments, utility companies, local businesses, scientific laboratories) who have a stake in southeastern Idaho. The committee is trying to promote how science and technology based in southeastern Idaho positively affects local communities and the general population. (Jerry.Crescenti@noaa.gov and Debbie Lacroix)

### ***Combined Federal Campaign***

FRD continued their tradition of contributing generously to the Combined Federal Campaign. They recognized that the uncertainties that cause anxiety for us as Federal employees have affected some others to a much greater extent. About 70% of FRD employees (9) contributed a little over \$2,300 to a number of worthy causes. (Joyce. Silvester@noaa.inel.gov)

### ***Papers***

Crescenti, G. H., and E. J. Dumas, 2002: Obituary — Timothy L. Crawford. *Bull. Amer. Meteor. Soc.*, **83**, 1680-1682.

### ***Travel***

Jeff French traveled to Tampa and Sebastian, Florida from November 11-15, 2002, to visit Velocity aircraft factory and to visit with AOC engineers.

### ***Training***

Jerry Crescenti attended a one-day training course in Idaho Falls entitled *Coaching and Teambuilding Skills for Managers and Supervisors*, sponsored by SkillPath Seminars on November 7, 2002.

Roger Carter and Neil Hukari attended the annual DOE Emergency Operations Center (EOC) requalification training on November 18, 2002.

The 5th Annual DOE-Idaho Fit for Life Health Fair was held November 20, 2002. The DOE extended an invitation to NOAA and other federal agencies in the local area to attend this event. In conjunction with the FEHB Open Season, representatives from Blue Cross/Blue Shield and Mail Handlers were at the Fair to provide benefit information about their plans and to answer questions. Services offered, at no charge to the attendees, were blood pressure, body fat analysis, diabetes testing, and lipid cholesterol testing. One-half hour classes on aerobics, yoga, fitness as you age, heart attack symptoms, heart care, and menopause/HRT were also presented. Five FRD employees attended the event. (Paula.Fee@noaa.gov)